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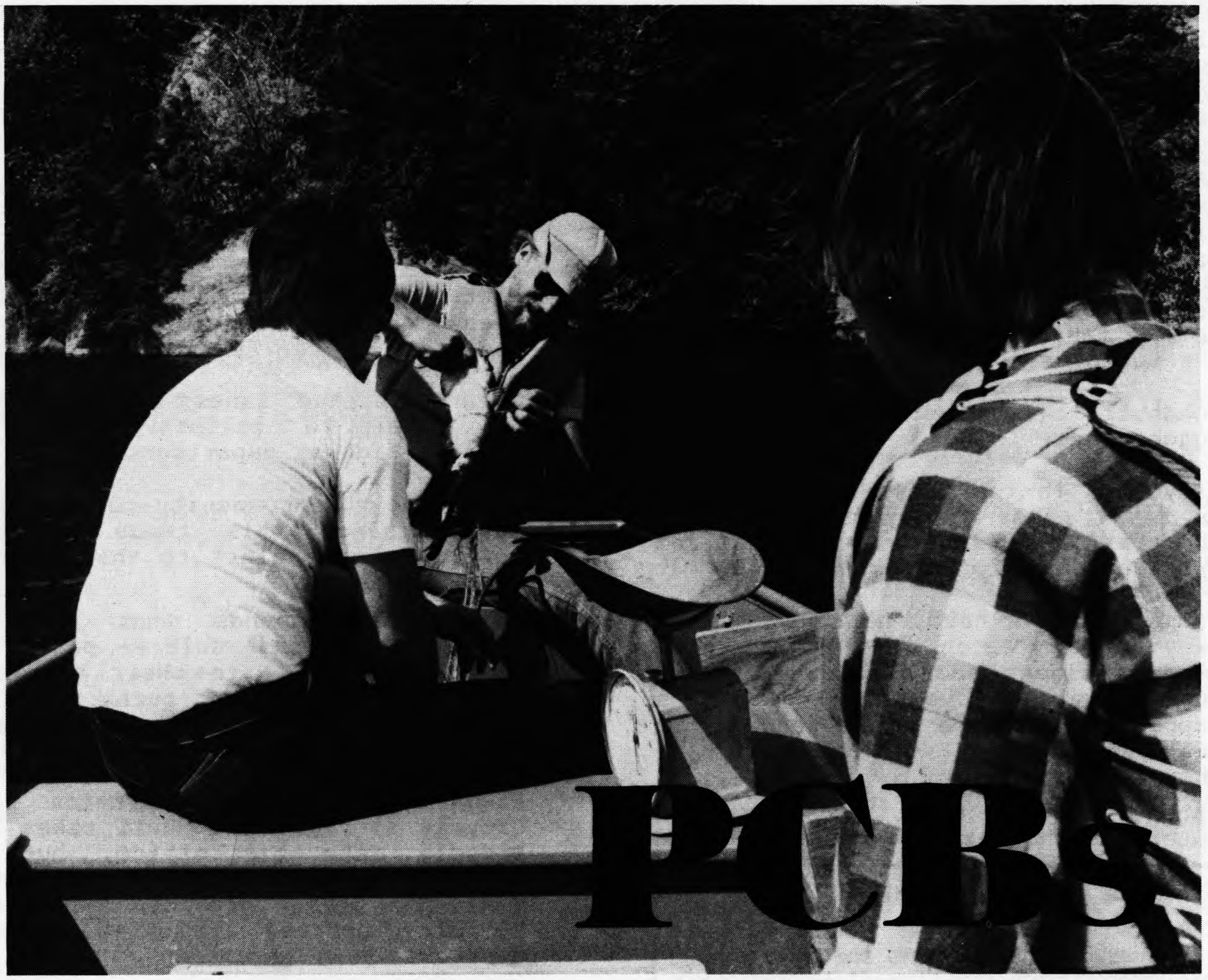

PCBs

HOW WIDESPREAD? HOW DANGEROUS? HOW DO WE DEAL WITH THEM?

Inside *Bike to Work, 2; Running Shoreline Beaches, 3; Who's Fishing? 6; PCB's: What's Happening? 7; Why They're Hazardous, 10; Health Effects, 11; Their History in the Housatonic, 11; Mudflats, 12; Marine Fishing Survey, 14; 208: Non-point Pollution, 16; Orphaned Birds, 17; Coastal Management: Progress, 18; Trailside Botanizing, 20.*

Try It, You'll Bike It!

The International Bicyclists' Network designated Saturday, June 2, as International Bicycling Day, and bicycle advocates around the world joined together to show support for the bicycle as an energy-efficient, non-polluting mode of transportation.

"We hope," said Terry Holland, Secretary of the Coalition of Connecticut Bicyclists which sponsored a rally in New Haven, "to make the public aware of the substantial contribution the bicycle can make towards helping to solve some of the transportation and environmental problems of our state."

Are you thinking of starting to commute on your bicycle? We asked one veteran cycling commuter for his recommendations on safety and comfort.

Richard Woodhull, Chief of the Public Water Supply Section, Environmental Health Services, has been bicycling eight miles from Bloomfield to his Elm Street office in Hartford for ten years. The eight-mile trip takes thirty-five minutes, and he bicycles three or four days a week on an average -- including all winter "except during snowstorms."

Woodhull offers encouragement and some suggestions:

* Bicycling in the city, in some ways, he says, poses fewer problems since the traffic is not moving so fast and the lanes are usually wider.

* Urban cyclists need, he says, "to be very alert. Watch out for yourself. Be intelligent and defensive. Make sure drivers see you and know what's happening. Drivers have a tendency to see cyclists but not register that they're there."

* Watch in particular, he says, for motorists who make right turns -- and left turns -- right in front of bicycles.

* Watch parked cars and cars stopped at intersections.

* It may be worth going an extra mile for good routes -- i.e., well cleaned streets, wide shoulders, etc.

* Be careful of the neighborhoods you ride through -- bicyclists have been mugged. Regular commuter hours, he says, are probably the safest time to travel in this respect.

* Put a horn and a light on the bicycle.

* In the winter, when you're likely to be riding at dusk, wear a fluorescent sash or other reflecting garment.

* Poor maintenance of road shoulders -- rough surfaces, sand, glass, litter -- poses one of the major safety threats to cyclists. Get involved. Get after highway departments -- through local environmental committees, for example, or regional transportation planning efforts -- to clean winter accumulations of sand and other litter from road shoulders.

* Clearly marked lanes and shoulders are a help to cyclists. Again encourage highway departments!

* Encourage your community to mark bike routes since this tends to make motorists more alert to the presence of cyclists.

* Woodhull recommends that cyclists carry a waterproof suit -- pants and short slicker -- in their bags for days when the weather turns wet. He also carries a pair of plastic bags for wet-weather foot protection.

* Encourage efforts to provide safe bicycle storage. Woodhull takes his bicycle into his office, but he noticed recently, in Denver, that the municipal garage provided supervised bicycle parking for twenty-five cents.

Cyclists can get in touch with the Coalition of Connecticut Bicyclists at 510 N. Church Street, Naugatuck, CT 06770 (729-5795). American Youth Hostels Hartford Area Council, P.O. Box 10392, West Hartford CT 06110 (232-2174) also provides helpful information for cyclists as well as recreational bicycling programs.

On our cover: Removing catfish from gill net, rear, Young Adult Conservation Corps member Jeffrey Carlson. With him, at left, Regional Fisheries Biologist Robert Orciari; right, YACC member Donald Mysling.

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Running State's Long Island Sound Beaches

Besides lifeguards, it takes planners and plumbers, managers, maintainers, and a legion of lawn mowers

Swim suit. Towel. Sun tan lotion. Picnic lunch. Umbrella. Beach chair. Blanket. Wonder sometimes, as you count down your gear getting ready for the beach, what it takes to get that beach ready for you?

According to Stanley Bates, Planner in DEP's Parks and Recreation Unit, "We spend all winter recovering from and repairing the wear and tear and damage and vandalism that summer brings to Connecticut's three State-owned beaches and getting them ready for the next summer."

Not only buildings, bathhouses, toilets, and campsites, but even parking lots and roads, he says, show the results of heavy use -- roughly three and one-quarter million visitors annually, a volume that generally peaks on the second weekend following the Fourth of July.

Last year Hammonasset Beach counted 1,586,990 visitors, Sherwood Island recorded 1,132,591, and Rocky Neck 533,312. On a peak summer day Hammonasset can accommodate about 30,000 people; Sherwood Island, 25,000; and Rocky Neck 13,000.

Above, State's lifeguards demonstrated their skills at 1978 Lifeguard Meet at Hammonasset Beach. Stretcher race covers fifty yards -- with egg balanced on "victim's " stomach.

The job of keeping up the parks is a big one not only because of their popularity but also because of sheer physical size. Hammonasset covers 934 acres, 41 of them on two miles of Long Island Sound beach. It has parking for 6,000 cars. Rocky Neck encompasses 561 acres, 12 of them on its mile-long beach, and has 2,300 parking spaces. Sherwood Island covers 209 acres, 21 of them on its mile of beach. It has parking for 5,000 cars.

"We aim," Bates says, "to provide 75 square feet of beach per person --so our visitors have room to spread out their blankets -- so parking spaces are limited to beach capacity since most bathers arrive by private car. A car, of course, may bring a family of ten. We also limit numbers of buses coming to any area -- mainly because of limited sanitary facilities which rely on on-site sewage disposal."

While volume of visitors accounts for plenty of wear and tear, nature also takes its toll, especially in the off-season. Over the winter, one continuing project is carting away "things that drift in after winter storms." At Hammonasset, in particular, there's a constant wash up of boats and pieces of wharves and piers and logs and bottles and buoys. Each of the parks has a front-end loader for dealing with heavy objects and, whatever the season,

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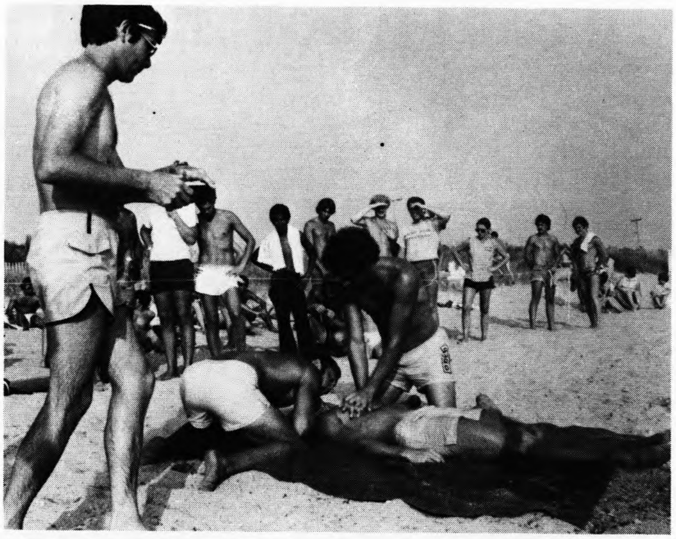


Lifeguards demonstrate resuscitation techniques. Fortunately, most first aid is for cuts, splinters.

whenever accompanying trucks are available, beach clean-up goes on.

Winter winds also mean shifting sands. Despite sand fences and dunes, which the Parks and Recreation Unit is attempting to restore to their original condition, there is likely to be a foot to a foot-and-one-half of sand to be shoveled off roads and boardwalks and crossings through dunes each spring.

Lifeguards, the staff members most people think of when they think of the beach, are only a few of the close to 350 people it takes to keep the three State shore beaches in readiness.

Hammonasset's year around staff numbers fourteen, Sherwood Island's and Rocky Neck's seven or eight each. These are maintenance "generalists," Bates says, whose duties include carpentry, equipment operation, electrical work, and plumbing -- especially plumbing, he says, which demands constant attention during the busy season.

For the summer, Hammonasset hires about 100 seasonal employees -- lifeguards, maintenance staff, ticket sellers, office staff, patrolmen, and nurses or first aid technicians. Sherwood Island hires about seventy and Rocky Neck about seventy. These numbers do not include food services staffs at the three parks. The food services are privately run concession operations which are periodically put out for bids. They employ, Bates estimates, an additional seventy or eighty people.

While permanent staff attend to more complicated repairs, routine "housekeeping" efforts occupy the attention of seasonal employees. During the summer, seven days a week, each park fields "constantly roving crews" whose job it is to pick up litter and to empty trash barrels. Additional crews at each park continually mow hundreds of acres of grass all season long. During the quiet hours of early morning and late afternoon, lifeguards not only hold physical conditioning sessions but also maintain the beaches day-to-day -- "raking, leveling sand castles, and filling holes."

Each summer all 74 acres of sand beach also get a fine-toothed grooming with a beach cleaning machine, a costly power-driven rake that picks up three to four inches of sand, sifts out last year's buried lunch bags and orange peels and other foreign materials as small as cigarette butts.

Moving at three to four miles per hour, and sometimes needing two passes to fluff up and thoroughly clean hard-packed sand, the machine takes many weeks to cover all the beaches where swimming occurs.

DEP Parks Unit's concerns include food and first aid, shimmering sands and free showers

There are also more personal services available to beachgoers. Each park has a nurse or first aid technician on duty from early morning to sunset, when park patrolmen nudge the last stragglers out of the water and off the beach. "On busy days, when there are 30,000 people in a park, there's almost always a line for first aid," Bates says, "with high incidences of barefoot injuries and burns from picnic fires."

A lot of what makes the parks pleasant and comfortable, however, has gone on preseason, behind the scenes, and at other facilities. Parking lots have been patched and re-striped, vehicle barriers have been replaced, and signs restored. The Department of Transportation regularly improves the surfaces of recreation access roads.

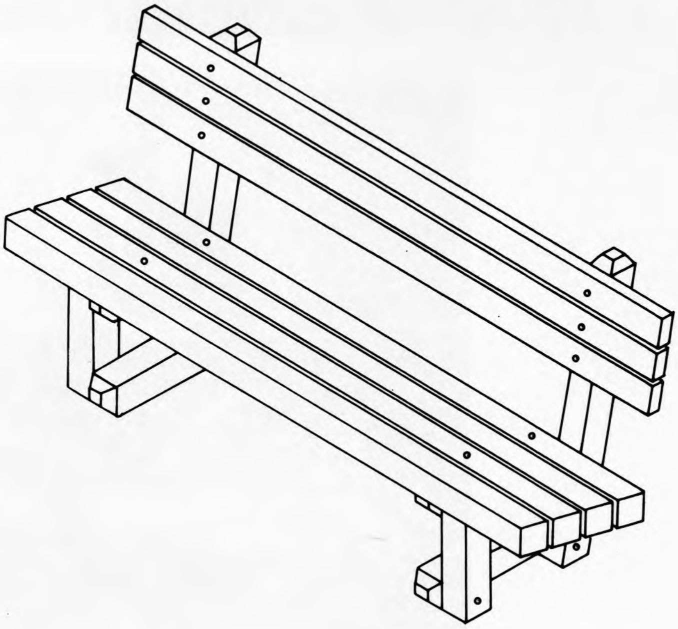
Trees, cut in State Forests, provide lumber for picnic tables. It is planed and pre-packaged at DEP's Portland Depot Sawmill. The tables are assembled, offseason, by park staff members. Elsewhere, at several different parks around the state, several hundred cast concrete park fireplaces were constructed, providing inside work during the winter season.

Lifeguards are recruited starting in mid-winter. Every year, Bates adds, qualified guards turn out to be "in critical supply. Our test is fairly demanding and some candidates later find jobs that are more lucrative or are more convenient. And we always need a few spares." So even with the season just beginning, interested persons should contact the Parks and Recreation Unit (State Office Building; 566-2304) about possible lifeguard spots.

Both Hammonasset and Rocky Neck offer camping -- 538 sites at Hammonasset and 169 at Rocky Neck. "Operating these areas," Bates says, "is like operating a small city. You have to be concerned with water and sewage and surveillance and accounting. And it all requires 24-hour coverage."

It also takes planning. "We try to keep ahead of the trends. So today's lots are bigger, for example -- 40 by 60 feet. When they were originally laid out, these camp sites only had to accommodate a Model-T and a tent. Today people may bring a house trailer, a utility trailer, a boat and two cars."

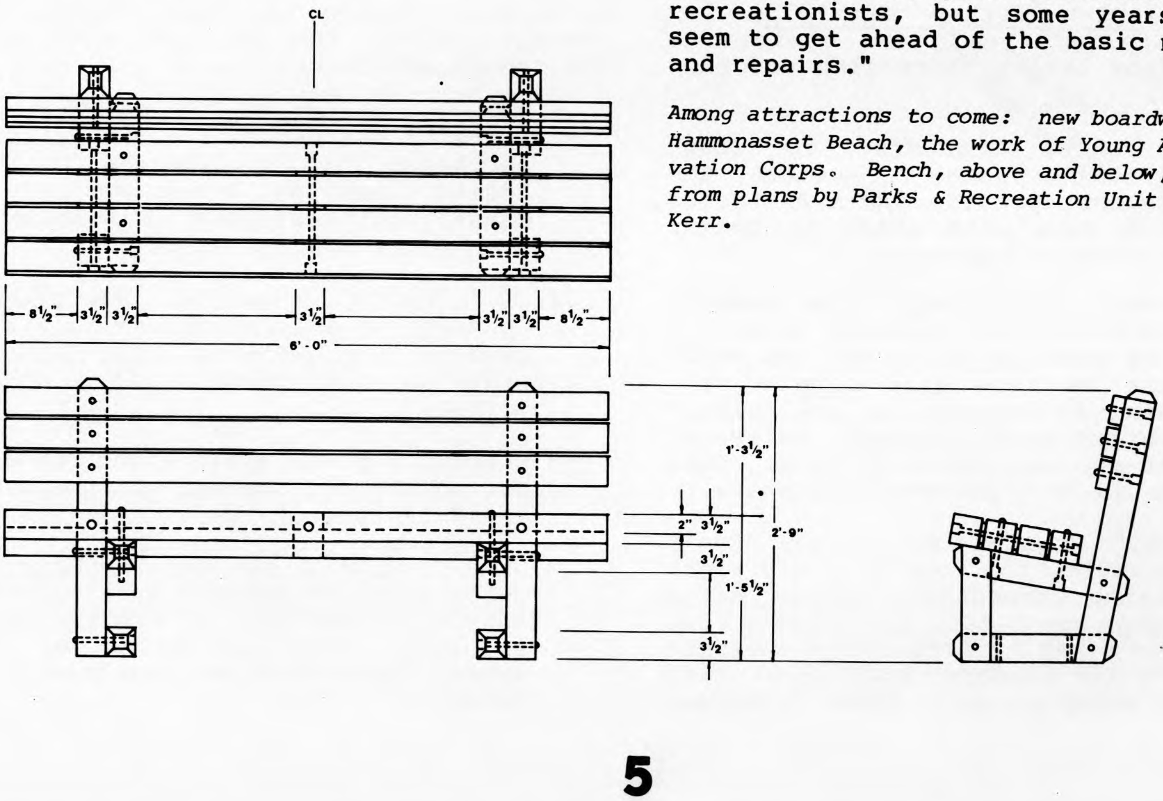
In the camping areas, as well as in the parks' day-use areas, Bates says, "We keep trying to find ways to serve the public better while reducing maintenance requirements. Today, for example, most campsites have paved areas for trailers and cars and modern sanitary facilities."



Attempted improvements don't always work out right off. Last year the parks introduced a contractor-supplied, coin-operated hot shower service at the campgrounds. "Vandals broke into the machines, stealing the money and generating many complaints." This summer, however, it won't be back to the cold showers for campers. "We've added our own timed, temperature-adjusted, push-button showers." Easy to use, not easy to vandalize, and free.

"Every year," Bates says, "we'd like these beaches to gain in attractiveness to recreationists, but some years we can't seem to get ahead of the basic maintenance and repairs."

Among attractions to come: new boardwalk at Hammonasset Beach, the work of Young Adult Conservation Corps. Bench, above and below, is a detail from plans by Parks & Recreation Unit planner Brian Kerr.



Fishing: Is the object

glamor or a fish fillet?

Who fishes? Where? For what? How? How often? What do they catch? And how do you find out the answers to these questions?

√ In 1976, Connecticut's 210,209 licensed freshwater anglers were asked to return a ten-question postcard-questionnaire attached to all fishing licenses sold that year. The analysis of this survey, Voluntary Angler Survey of 1975, has recently been published, and copies are available from DEP's Information and Education Unit.

The results, according to Staff Fisheries Biologist James C. Moulton, the project's leader, provide DEP's Fisheries Unit baseline data with which to better serve Connecticut's fishermen.

"You can't effectively make management decisions without knowing what the people you're managing for want and need. Now at least we know what some of the people fishing in Connecticut are doing." (Juveniles do not need licenses. Saltwater fishing does not require a license. Some anglers over 65 have permanent licenses.)

"Before," Moulton said, "we didn't know, for example, that one of every eight persons fishing Connecticut waters was a woman. Or that women fish differently from men. Until now, 90 percent of our contacts have been with persons associated with organized fishing groups. These fishermen represent only a small part of the total fishing population. We need to know more about various classes of fishermen -- not only those who go out for 'glamor' fishing but also those strictly out for something to eat."

Almost twenty-seven percent (55,905) of the postcard surveys were returned. Fifty-seven percent of these (31,701) were useable. Among the data and conclusions the report offers are:

* Almost ten percent of Connecticut's sixteen years-old-or-older citizens purchased fishing licenses in 1976. Adding juveniles, about one in eight Connecticut residents is involved in freshwater sport fishing.

* In highly urbanized Southwestern Connecticut only about one in sixteen persons is licensed to fish -- probably reflecting a lack of opportunity.

* Elsewhere one of every eight Connecticut adults is licensed for freshwater sport fishing.

* Almost eighty percent of Connecticut's licensed anglers participate in more than one type of fishing --lake and pond, river and stream, or saltwater. About half are involved in all three.

To P. 15.

WHAT ARE WE DOING ABOUT PCBS PCBS PCBs PCBS PCBs PCBs PCBs IN THE HOUSATONIC

By Thomas J. Turick, PCB Program Coordinator

The Housatonic used to be known as one of the finest fishing streams in the region, with an abundance of trout and other species. Now, because of the discovery of PCBs in sediments and fish, sportsmen are advised to return their catch to the river. Numbers of trout stocked in 1978 and 1979 by DEP have been radically reduced. Meanwhile, people are asking about the nature and extent of the problem, its implications for human health, and possible remedies for the situation. Three major studies, geared to answering these questions, begin this spring and summer. One will examine ten times the numbers of Housatonic fish ever examined before to see which, if any, are safe for human consumption. A second will look into PCB concentrations in and movement of sediments in the river. The third will check the health of persons who've regularly been eating fish taken from the Housatonic.

After the discovery, in 1976, that sediments and fish from the Housatonic showed high levels of PCBs, the Commissioner of the Department of Health Services (DOHS) issued a warning against consuming all species of fish taken from the Housatonic from Lake Zoar north to the Connecticut-Massachusetts border.

In response to this health warning, DEP reduced its annual trout stocking in the river from 22,000 to 6,000 fish. Fewer fish meant fewer fishermen, and various Housatonic area businesses reported declines in trade. The economic effect, coupled with growing public concern about the health implications of the warning, provided the impetus for legislation that followed.

In 1978, the Connecticut General Assembly passed legislation appropriating $200,000 to the Department of Environmental Protection "....for the purpose of studying alternatives for the elimination of sources of polychlorinated biphenyl contamination of the Housatonic River and its impoundments, Lakes Zoar, Lillinonah and Housatonic, including examination of sediment transport and bottom removal."

After a well-attended public meeting in September 1978 and the formation of a PCB Program Guidance Committee shortly thereafter, the Department of Environ-

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mental Protection began a program of PCB research for 1979 and 1980. By January 1979 a series of studies was developed which places emphasis on the understanding of: (1) how PCBs move through the river; (2) how much of a problem PCBs are to general health; and (3) the extent of PCB contamination in Housatonic River fish. The three projects are getting under way this spring and summer.

Fish Sampling

The 1979 Housatonic River PCB Fish Sampling Program began on June 1, 1979. The primary goal of this collection of 900 warm and cold water fish of various species is to enable the Department of Health Services to determine, in time for the 1980 or 1981 fishing seasons, which, if any, species of fish in specific areas of the Housatonic River are safe for human consumption.

The emphasis of the 1979 program is on eleven warm water species in four reaches of the river. The eleven species are: largemouth bass, smallmouth bass, yellow perch, white perch, catfish, suckers, crappie, bluegill, bullheads, and carp, with pickerel to be added, if collectible. The four areas of the river where collection is occurring are the impoundments of Lake Zoar, Lake Lillinonah, and Lake Housatonic and the Bull Bridge impoundment. Trout will also be analyzed and are being collected from the Falls Village-Cornwall stretch of the river.

Water and Sediment Study

Due to the low solubility of PCBs in water, it is believed they are not transported great distances in solution. Research shows, however, that PCBs are readily adsorbed onto fine particles in river bottom sediments. Sediments in the Housatonic have shown PCBs in concentrations from a high of around 135 parts per million (ppm) near outfalls and in certain impoundments to a low of one or two ppm in the least polluted areas.

The water in the Housatonic River, which is regularly sampled for PCBs, contains low concentrations, although the concentrations may be significant locally.

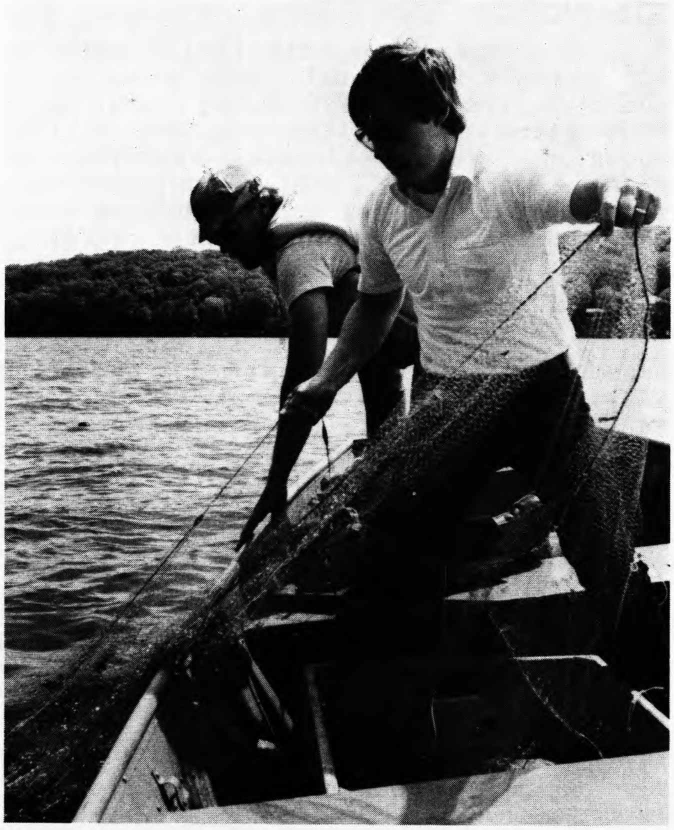
The 1979 Housatonic River PCB Water and Sediment Sampling Program began in April with the placement of three daily suspended sediment stations in the river. The primary goals of this joint DEP/US Geological Survey (USGS) program are: (1) to establish a data base for sediment concentrations and PCBs in the Housatonic River; and (2) to study the role of various reaches of the river in Connecticut and Massachusetts in contributing PCBs to the river system. If funds and manpower are available, the DEP would like, eventually, to model the PCBs in the river system.

The first objective of the 1979-1980 program is to determine through appropriately scheduled sample collection, the present concentrations of PCBs in water, sediment, and bed material in various reaches of the river.

Collection of storm event samples for examination for PCBs in water sediment mixtures will begin in 1980 as will a study of the thickness and distribution of sediments in major river impoundments, reservoirs, ponds, and lakes of the Housatonic River, using seismic reconnaissance profiling. Determination of PCB concentrations by individual compound in the deposited sediment in the river and its impoundments will also be made in 1980.

In summary, the first year will consist of sediment sampling at three stations in the basin. The second year will incorporate a second year of suspended sediment data collection and will add storm water sediment PCB analysis, seismic reconnaissance, and bed material sampling at 200 sites.

Collecting fish: Fisheries Biologist Robert Orciari, front; YACC member Jeffrey Carlson.



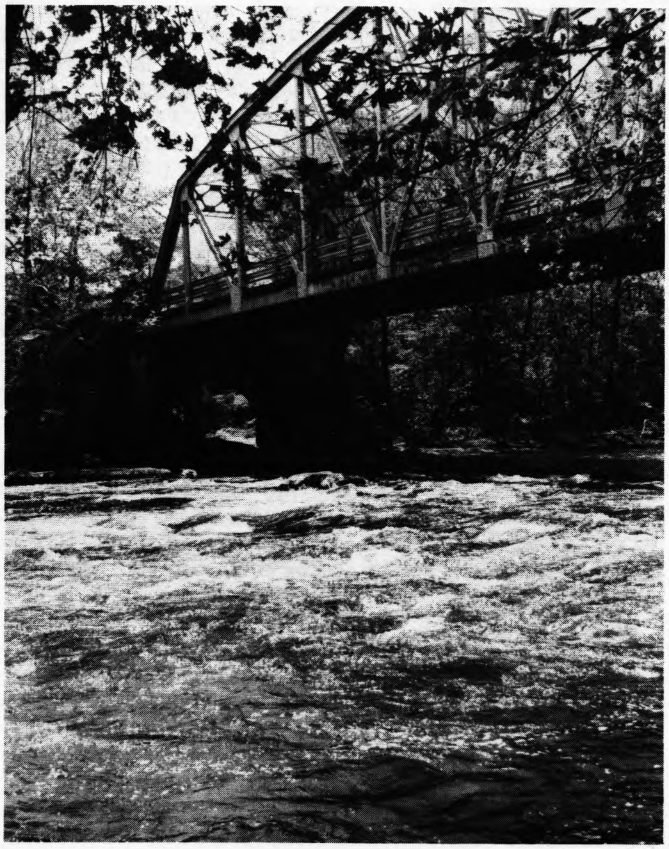
Health Study

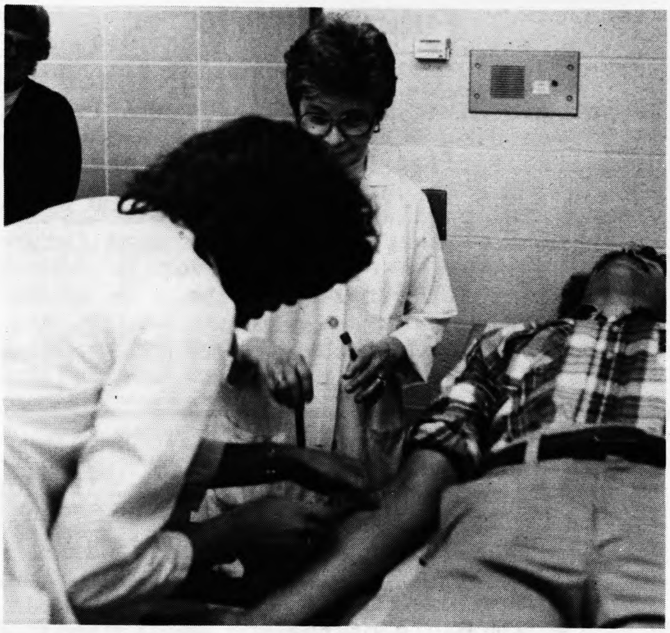
The accumulation of PCB residues in Housatonic River fish poses a potential health hazard to hundreds of Connecticut fishermen and their families. The data indicate that PCB levels in some trout have reached over eight times the federal standard of five ppm. Those findings prompted the DOHS to post signs along the Housatonic warning of potential health dangers which may be associated with eating PCB-contaminated fish. A significant number of residents, however, have disregarded the health warnings and continued to consume the fish.

A thorough study of the scope of this health problem is now being conducted by DOHS. The primary goal of the 1979 Health Program is to define the population at risk because of ingesting PCB-contaminated fish as well as the severity of the associated health effects so appropriate actions can be taken by the State of Connecticut to protect the public.

This year's study will examine biochemical effects of PCBs on persons who have received non-occupational exposures (i.e., ingesting PCB-contaminated fish) and evaluate the potential health hazard. To date, only serum PCB levels and overt symptomology have been looked at in long-term, low-level exposures.

One PCB sediment sampling site: bridge over the Housatonic at Gaylordsville.





Taking blood: medical technician Gail Zordan; Dr. Marian Michini, Chief, Special Lab Services.

A controlled study will begin in June. Two hundred non-occupationally exposed persons have been selected from among members of various Housatonic fishermen's groups and their families. Families who eat Housatonic River fish on a regular basis have been asked to participate. Volunteers have been solicited to serve as a control group. Subjects have been selected after screening out any other known PCB exposures and have been matched for age and sex.

A questionnaire was filled out on all subjects as well as on controls to obtain medical and PCB exposure histories. Blood will be taken and studied for PCB levels as well as for evidence of liver dysfunction and immune system abnormalities.

Significant differences between the case and control groups will be looked for. Correlation of health effects with blood PCB levels will be attempted where there are unexplained findings suggesting liver or immune system dysfunctions or where there are other symptoms.

It is also important that the numbers of people in Connecticut who are eating PCB-contaminated fish be determined to establish the extent of the health hazard posed. In 1979, therefore, a random sample will be selected from among freshwater fishing permits and a survey taken which will consist of a questionnaire, requesting information on fishing locations and types and amounts of fish eaten.

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Future Efforts

Beyond 1980 the PCB Program for the Housatonic River is indefinite. A lack of data regarding PCBs requires that the problem itself first be closely defined. The PCB problem is both a health and an environmental problem. In this dual context, it must be evaluated whether or what future action is necessary. The overall Housatonic River PCB Program can best be viewed as a problem-solving process which will eventually produce a series of PCB management strategies.

PCBs

WHY ARE THEY A PROBLEM ?

Polychlorinated biphenyls (or PCBs) is the generic name for a group of synthetic organic compounds consisting of two linked benzene rings with up to five chlorine atoms attached to each of them. It is among the most stable groups of organic compounds known. These compounds have low solubility in water, low vapor pressure, low flammability, high heat capacity, and low electrical conductivity, all of which made PCBs useful for dielectric and heat transfer fluids.

PCBs are similar in structure to DDT, but they appear to be even more stable in the environment than is DDT. PCBs persist because the enzymes of organisms which decompose wastes are unable to shear the bond between the chlorine atom and the biphenyl structure. The only efficient way to destroy PCBs is to burn them in special industrial incinerators generating temperatures of about 2000°F to 2700°F (the temperature required depends on the residence time).

Polychlorinated biphenyls were introduced to this country in 1929 by the Monsanto Company, which remained the sole U.S. Manufacturer. They have had many industrial uses. Until 1971, the year the FDA put PCBs on its list of hazardous substances in foods and Monsanto halted sales to all customers except those utilizing the substance in "closed systems," PBCs were used in heat exchangers, hydraulic brake fluids, ironing board covers, adhesives and plasticizers, waxes for investment casting, carbonless carbon paper, printer's ink, photocopy toner, paints, sealants, caulking compounds, soaps, and a vast array of electrical component parts.

About ninety-five percent of all manufactured PCBs -- approximately 1.4 billion pounds since 1929 -- probably have entered or, without interception, will enter the world's waters.

PCB contamination is not unique to the Housatonic. Many of the world's rivers, lakes and oceans have PCB pollution in varying degrees. The Hudson River in New York probably has the greatest problem, with 650,000 pounds of PCBs on the river bottom and very high concentrations of PCBs in fish. Almost seven million dollars has been spent in studying the Hudson PCB problem, and the State of New York has asked the Federal government for $25 million more to remove highly concentrated PCB deposits in the upper riverbed.

PCBs can enter water through either industrial waste discharge or leaching from sanitary landfills and other disposal sites. Not much is known about the latter process, although we do know that the annual amount of PCBs put into U.S. landfills is ten to fifteen million pounds. The portion of this getting into the groundwater each year ought to be negligible, but should certainly be determined.

PCBs are also thought to enter the air from incineration of paper and other industrial processes. According to one study, PCBs also enter the air from aqueous solutions quite rapidly, in spite of their low vapor pressure. However, it seems PCBs' affinities for adsorption onto organic particulate matter in water ought to retard ready evaporation. An important item of data needed is a better understanding of the mechanisms by which PCB gets from water to air. Once in the air, PCBs can be transported on a global scale and can reach lakes and rivers in isolated areas.

In river systems, PCBs tend to accumulate in the sediments because they are heavier than water and do not dissolve. Fish absorb PCBs through their gills and skin and eat contaminated particles and organisms near the river bottom.

In waters, PCBs do not move large distances because of their low solubility; instead, they are readily adsorbed on fine particles, which are transported in suspension and then settle as bottom sediments. These sediments can be relatively well-defined and may remain stable for long periods of time after the initial contamination, although the movements of contaminated sediments due to normal river flow, high-water flow, floods, and tides have not been thoroughly mapped.

Within sediments, PCB concentrations can extend to depths of more than several meters, and it is not certain how readily they can be exposed. Concentrations of PCBs or "hot spots," where PCB concentrations are particularly high, occur. An ability to predict these will be crucial in any moves to "clean up" bodies of water.

Without some remedial action, PCBs will probably remain in any river a long time -- they will not just go away. Some experts estimate that if nothing is done, PCBs might remain in the Housatonic for fifty years or even longer.

Overall, at present, knowledge about PCB distribution in the environment is not sure enough to justify any "search and destroy" approachs to handling PCB contamination.

PCBs

WHAT ARE EFFECTS ON HUMAN HEALTH?

The nature of the threat to human health from exposure to PCBs is not yet fully known. The effects of long term, low level PCB exposure, such as occasional meals of Housatonic fish, have not yet been determined.

The most dramatic example of human poisoning by PCBs was the so-called "Yusho" incident in Japan in 1968, when a supply of cooking oil was accidentally contaminated with a very high concentration of PCBs (2000-3000 parts per million -- ppm). Persons who ate the oil were permanently affected with serious skin, nervous, and lung disorders.

A study is now under way at the Mount Sinai Medical School in New York City to evaluate the effects of high levels of PCB exposure on factory workers. Preliminary reports show higher than normal incidences of liver, skin, digestive and lung disorders. PCBs are known to cause cancer in laboratory animals. There is some evidence that workers exposed to PCBs have an excess cancer risk as well.

PCBs

HOW DID THEY GET INTO THE HOUSATONIC ?

The largest known (to date) contributor of PCBs to the Housatonic River environment was the General Electric Company in Pittsfield, Massachusetts. A major manufacturer of transformers, in addition to other products, GE's use and distribution of PCBs has resulted in industrial waste leakage to the Housatonic River since the early 1930s.

When GE first started operations with PCBs in Pittsfield, the substance was known to be well suited to and very safe for a large number of electrical uses. The slowly developing research regarding PCBs' indefinite stability and possible toxicity or carcinogenicity only accumulated in the late 1960's and 1970's.

Over the last ten years, GE at Pittsfield has apparently responsibly undertaken extensive system changes and rigorous control measures to prevent the escape of PCBs to the environment during manufacture, delivery, use, maintenance, repair, or disposal of transformers or exposed parts. In 1976, GE decided to replace PCBs in closed electrical systems with a silicone liquid. Pittsfield manufactured its last transformer using PCBs in March 1977.

Since then, work has been under way at Pittsfield to remove all the equipment used to store, filter, or distribute PCBs -- including demolition of tanks, pipes, and systems in an environmentally safe manner. GE has also sent instructions for safe disposal of PCBs to customers who purchased their transformers.

At Pittsfield, GE has developed and operated a high-temperature incinerator, the only practical method known for fully destroying and disposing of PCBs.

Most recently, GE has largely completed a new ground water collecting system and waste water treatment facilities to remove and destroy the small amount of waste PCBs remaining in the Pittsfield plant environment.

Nature Notes

by Penni Sharp

Mudflats

Tidal mudflats are among the most important but perhaps least appreciated of Connecticut's coastal habitats. Unfortunately, the benefits of this particular habitat are not readily visible. In addition, especially during summer months, mudflats may become odorous, causing those in nearby communities to overlook their vital functions and perhaps take little interest in their protection and preservation.

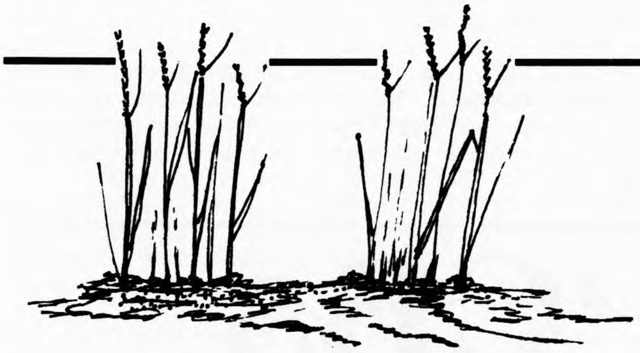
Historically, mudflats have been subject to dredging and other human activities which have brought about the destruction of much of this habitat type. As states enact programs to protect coastal resources, the future of mudflats may be less jeopardized.

Formation of Mudflats

Mudflats are formed in areas where fine sediments can accumulate. Basically, there are two sources from which sediments are derived. In one case, fine materials eroded from the land's surface enter rivers and streams and are carried in suspension to the sea. Sediments can also be produced by the scouring action of storm waves. When storm waves strike layers of silt and clay that may be found in deposited glacial drift, erosion of the clay and silt will occur, releasing fine sediments into the water.

Once these fine sediments enter the water, due either to river runoff or wave action, they are likely to remain in suspension and be moved by currents into embayed or quiescent areas. Below the zone of wave action, at times of slack water, or in protected areas, the sediments settle out forming a fine layer of mud on the bottom. Once deposited, mud particles become cohesive and fairly stable, and layer upon layer of mud accumulates.

Tidal mudflats appear when the accumulation of sediments occurs in the nearshore zone and is built up to a level close to that of the average sea level. A mudflat, then, is an area which is inundated during high tide, exposed at low tide, and which remains unvegetated. From this situation, a further development can occur. Spartina grasses, specially adapted plants which are able to tolerate both a high degree of salinity and periodic inundation, may colonize on the mudflat. This normally coincides with the build-up of sediments to the mid-tide level. Once the spartinas become established, decaying vegetation collects among the grasses, layers of peat develop over time, and the formation of a salt marsh is initiated.



Spartina alterniflora

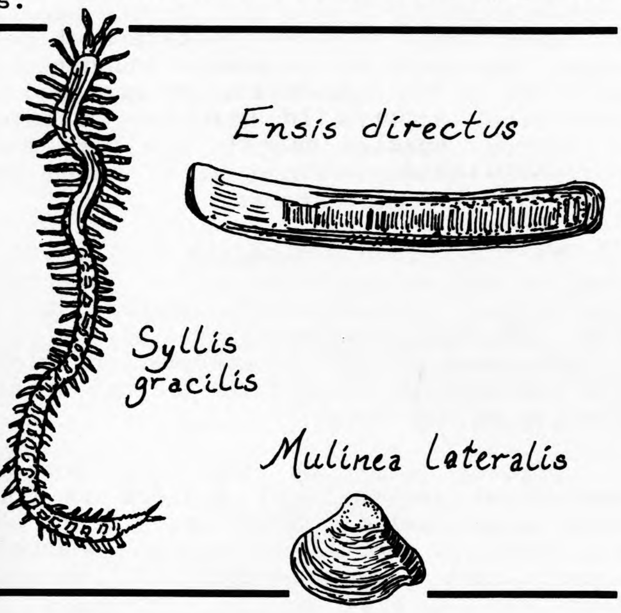
Mudflats may serve as the early successional stage of the salt marsh or may remain as mudflats in their own right. A good example of the mudflat in Connecticut is found in New Haven Harbor's Long Wharf and City Point areas.

The Mudflat Community

The soft silty substrate typical of the mudflat provides an ideal habitat for those animals which are specialized for burrowing. They belong to the group of bottom-dwelling animals or benthos termed "infauna" as they are found below the surface of the bottom. Species include molluscs such as the razor clam (Ensis directus), sunset shell (Macoma balthica), surf clam (Mulinia lateralis), and many species of worms.

While burrowing affords these animals a degree of protection, being below the bottom surface poses certain problems: for example, feeding. Benthic animals have overcome the difficulties by developing two unique methods of feeding -- suspension feeding and deposit feeding.

In the case of the suspension feeders (the bivalves belong to this group), the animals remain below the surface and, when the tide is high, draw in water, filtering out of it the organisms upon which they feed. Some of these animals have evolved unique devices such as siphons or nets which facilitate the food gathering process.



The deposit feeders also feed when the tide is in, protruding the feeding end of their bodies and gathering "mud" particles which they ingest. The mud passes through their bodies and is returned to the sea floor as "castings." Both suspension and deposit feeders feed largely on bacteria which is a major component of the marine food chain. The bacteria play a vital role in the breakdown of the cellulose of phytoplankton, microscopic plants which are often the first link in the aquatic food chain. A simple diagram of this food chain is at right.

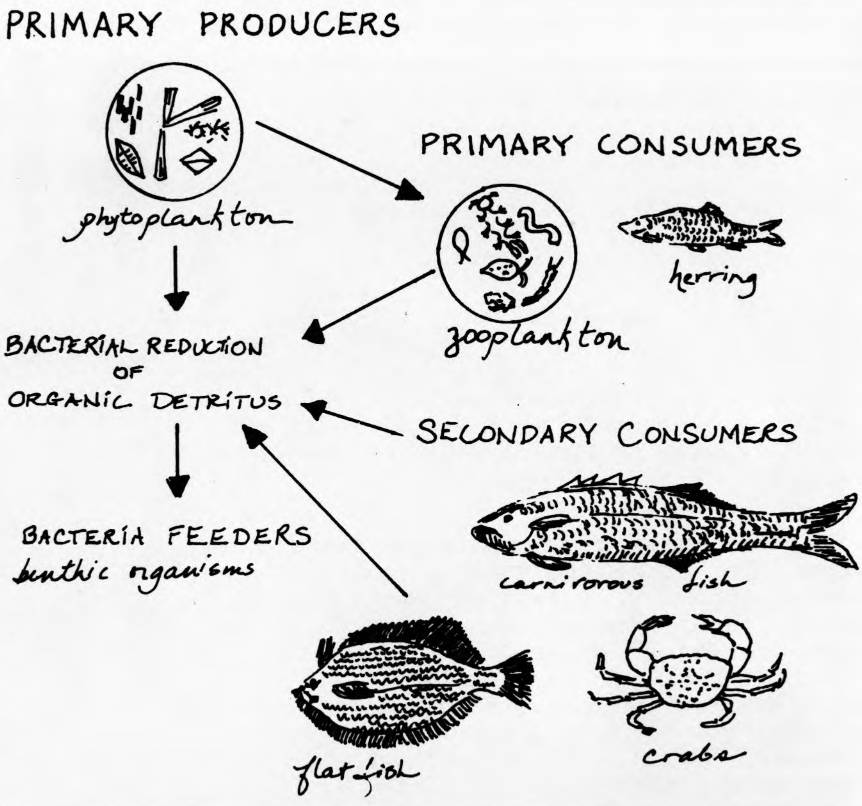
Where deposit feeders are found, usually in areas with a mud bottom, their feeding activities result in a constant reworking of the sediments, sometimes altering the chemistry of the bottom zone. Mud particles are resuspended, and if strong tidal currents are present, remain in suspension. In this type of situation, suspension feeders have a difficult time coexisting with the deposit feeders. However, in quiet areas where tidal currents are weak and the particles can settle rapidly, both suspension and deposit feeders are found.

While the mudflats provide a permanent home to these important benthic invertebrates, many other faunal species are temporary visitors. These include eels, flounder, killifish, and blue crabs which come in during periods of high tide to feed upon the invertebrates. Immature representatives of many species of fish are found frequently in the zone of the tidal mudflats, attesting to the value of this habitat as nursery grounds for fish.

During low tide, mudflats are especially attractive to many species of shore birds which can be seen probing the mud, in non-stop fashion, as they search for their invertebrate prey. Gulls and waterfowl also frequent mudflats in their quest for food.

Protection for the Future

Tidal wetlands and the mudflats often associated with them are increasingly being recognized for their vital role in providing nursery and spawning grounds for many species of finfish and shellfish, nesting sites and shelter for birds and other wildlife. While it is possible to examine the role of mudflats, in no way should they be regarded as separate entities, as, ultimately, they are intimately connected with the total salt marsh community.



Survey looks at the "who, what, where, when, and how much" of state's marine fishing

By Robert Sampson, Jr., Marine Recreational Fisheries Biologist

In the fall of 1978 the Department of Environmental Protection received a grant from Coastal Zone Management to develop a marine recreational fisheries program. The first objective of this program is to assess Connecticut's marine recreational fisheries resources, beginning with an inventory of fishing sites such as marinas, fishing piers, launch ramps and shore access points. This effort will be followed by a design phase during which methods will be developed for adequately sampling these sites to obtain biological as well as sociological and economic information from recreational fishermen.

Concurrently with the beginning of the recreational fisheries program in Connecticut, the National Marine Fisheries Service (NMFS) began a coastwide recreational fisheries survey. This survey is a comprehensive undertaking comprising an angler intercept survey and a random number telephone interview survey. The telephone survey will expand the angler intercept survey data to fit the populations of the states in question in order to make catch and effort estimates as accurate as possible.

A consulting firm, Human Sciences Research Inc. of McLean, Virginia (HSR), received the contract from NMFS to design the sampling frame and compile the data for the entire coastwide survey. HSR in turn gave conservation agencies in coastal states first option to conduct the angler intercept portion of the survey within their waters. The State of Connecticut has contracted with HSR to conduct the intercept phase of the survey through DEP's Marine Region.

Questions to be answered during angler intercept interviews will give indications of the time and money expended by Connecticut anglers in addition to catch per effort, species sought, and fish most frequently caught, along with length and weight of observed catches.

Marine Region biologists will spend a total of 189 man-days at angler intercept work along Connecticut's coast during 1979. HSR will supplement this effort with an estimated 30,000 telephone interviews with Connecticut households located within 50 miles of the coast

Efforts will be made to contact Connecticut recreational anglers in four basic target modes. These are anglers who fish from: 1) natural structures (beaches, banks, rock formations); 2) manmade structures (piers, docks, jetties); 3) privately owned and rental boats; and 4) party and charter boats. Over 450 fishing sites have been located and logged by fisheries biologists and divided into these basic modes.

➡

Robert Sampson, at right, discusses day's fishing with Ronnie Strong of New London.

Interviewers will be conducting angler intercept interviews at predesignated sites of each type during the course of given two month sampling units. The number of days expended sampling each fishing mode is based on the estimated proportion of use of each by anglers. Thus fifty percent of the sampling will focus on private and rental boats, twenty-nine percent on beaches and banks (natural structures), thirteen percent on manmade structures, and eight percent on party and charter boats.

In addition to the NMFS Survey, Marine Region biologists will be conducting two related programs. The first is a "headcount" or "angling pressure survey." This will entail covering, on a monthly basis, the entire list of shore-based fishing sites and a randomly selected group of boat based sites (marinas or launch areas). On each day of sampling the number of people using these sites will be noted. Over time this will give an index of usage which, combined with the intercept data, should give biologists a good insight into the distribution and nature of Connecticut's marine sport fishery. This information will help determine where sampling efforts should be concentrated in future years. In addition, information obtained from "angler pressure surveys" will help biologists determine the best areas for angler access improvements such as construction of launch ramps, piers, and jetties.

The second of these programs is a volunteer angler survey in which about 100 anglers from organized striped bass fishing clubs will be asked to maintain logbooks on their daily fishing activities. Logbook entries will include trip-specific questions dealing with effort, areas fished, cost of trip, fishing methods used, fish sought, and catch information such as species, numbers, and sizes. Although biased, this information will provide a data base to compare with the broader angler intercept data.

At New London wharf, Sampson measures catch of Salvador Reyes of Waterford.

Freshwater Fishing Survey

From P. 6

- Over forty-five percent of freshwater anglers are juveniles. One in every five juveniles (nearly 168,000) fished with a licensed angler at least once in 1975.
- Of licensed freshwater anglers, 87.5 percent were men, 12.5 percent were women. Age and sex distribution of anglers indicated that sport fishing is a family activity. The average age (24) at which women began fishing suggests that many begin to participate with husband or children.
- Licensed anglers made over eight million fishing trips in 1975. Of these, 6,598,000 were to freshwater sites, 1,582,700 to saltwater sites.
- One-half of one percent of licensed anglers did not fish at all.
- The median angler made eighteen fishing trips in 1975, while the average number of trips was thirty-eight.
- Trout are the most popular species, preferred by seventy-seven percent of anglers, representing twenty-nine percent of all fishing effort, and twenty-five percent of the catch. Bass are the second most popular, though they attract a smaller number of participants.
- While gamefish are preferred by fishermen and account for eighty-five percent of the fishing effort, panfish make up a third of the catch.
- Almost five percent of those responding to the questionnaire admitted to catching no fish though they averaged eight fishing trips.

"We hope," Moulton adds, that people will want to learn more about the numbers and activities of their fellow citizens, regardless of their membership or non-membership in the angling community."

208 WATER QUALITY MANAGEMENT

209 COURT ST., MIDDLETOWN, CT. 06457 347-3700
By Joseph M. Rinaldi, 208 Public Participation Assistant

208 Program Assessing Non-Point Source Pollution

The Connecticut 208 Program has concentrated its efforts on the problem of non-point source pollution control. Non-point source pollution is broadly defined as any type of water pollution which does not originate from a pipe. Some examples of non-point source pollution are urban runoff, stormwater runoff, agricultural runoff, erosion and sedimentation, leachate from landfills and industrial waste disposal areas, groundwater contamination from failing septic systems, etc. In all instances, these types of pollution are diffuse and can contain many and varied pollutants.

The U.S. Environmental Protection Agency has estimated that roughly fifty percent of the nation's water pollution is caused by non-point sources. This percentage will increase as municipal and industrial wastewater discharges (point sources) are brought under control. In essence, non-point source pollution will constitute the primary water pollution problem of the future.

During the 1979-80 Connecticut 208 Program, the impact of non-point source pollution on approximately seventy-five twenty-square-mile drainage basins will be assessed. The assessment is intended to provide a first-cut evaluation of the present and future impacts on non-point sources on water quality. This could provide a basis for drainage basin classification. It may also serve to "red-flag" particular problem watersheds for more detailed assessments in the future.

A consultant, the Center for the Environment and Man, was engaged to produce a non-point source assessment methodologies manual which will be used for the study. The manual utilizes mathematical modeling to quantify non-point source pollutant loads as well as to qualify the in-stream effects of these pollutants. Different methodologies are included for urban and non-urban areas. The effects of non-point source pollution on dissolved oxygen will also be determined. Nutrient and heavy metal concentrations will be determined as well.

Each of the fifteen regional planning agencies will utilize the manual to assess the drainage basins which are located within their regions. Those agencies which have personnel with water quality backgrounds will conduct the assessment themselves. Consultants will be hired to run the assessment for those agencies without such staff.

The results of the study will assist the 208 Program in the development of effective non-point source pollution controls. In many instances, non-point source pollution is caused by the unwise use of the land. Therefore, wherever appropriate, suitable land use practices can be recommended so that communities can incorporate non-point source controls into future development. These preventive practices are a much cheaper way of attaining acceptable water quality than the expensive route of building structural controls. That should be good news for everyone.

Coastal Conferences

Three overlapping coastal and marine related conferences sponsored by the Coastal Society, the International Geographical Union-Commission on Coastal Geography, and the New England-St. Lawrence Geographical Society -- will be held at the Sheraton Newport, Rhode Island, November 6 through 10.

The Coastal Society's Fifth Annual Meeting, entitled "Resource Allocation Issues in the Coastal Environment" will be held November 7-8.

The regional meeting of the International Geographical Union's Committee on the Coastal Environment will be held November 8-9. On November 8, the Coastal Society and the IGU will hold a joint session. On November 9-10, the New England-St. Lawrence Valley Geographical Society will hold its annual conference. The opening morning's theme will be "Coastal Geography of Southeastern New England."

Inquiries can be directed to Niels West, Coastal Society Annual Meeting Program Co-ordinator, Department of Geography and Marine Affairs, University of Rhode Island, Kingston, RI 02881.

Reprinted from: Pet News Magazine

Caring for Orphaned or Injured Birds

By John J. Dommers, Regional Director, New England Region, Humane Society of the United States.

1

If you find a baby bird which appears to be healthy, check first to see if the mother bird is nearby. She may be nervously flying from tree to tree making a lot of noise to express her concern. If this is the case, do not attempt to handle the baby bird. . Chances are good that after you go away, the mother will come to the rescue. If not, you will have to become a foster parent for the orphan bird.

2

To care for the baby bird you will first have to make it a comfortable "nest." A shoe box or small carboard box lined with shredded paper toweling, tissues, or soft rags makes an excellent temporary home. The paper or cloth bedding will have to be changed regularly to keep the "nest" clean. The box should be placed in an area where the bird will be warm and free from cold drafts.

3

Feeding baby birds is not difficult. It has been found that canned dog food which is moistened with water is an excellent "balanced" diet for baby birds. Hamburger or liver meat cut into small pieces is also good. Hard boiled eggs, when mashed with milk to form a paste, is also a good choice for baby birds.

John Dommers photos

4

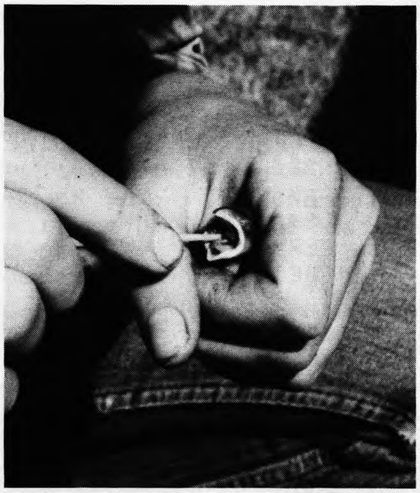
To feed baby birds, place a small amount of food on a small stick such as a toothpick and hold it in front of the bird's beak. Usually, baby birds will see the food coming and open their beaks. If not, you will have to gently open the beak with your fingers. Place the food far back in the mouth of the bird.

5

Never use an eye-dropper to give baby birds water. Chances are you may drown them. It is best to soak either the bird's bread or other prepared food in water before feeding them. Placing water on a teaspoon and letting it drip slowly into their open beaks (only if the bird opens its own beak) is also a good way to give baby birds a drink. Most of the time they get enough water from moistened food.

6

You will have to feed very small birds once every three hours during the day. Feed small amounts of food at each feeding. Older birds (with all their feathers) can eat larger amounts of food at longer intervals (not exceeding 5 hours).



7

If, by some chance, the baby bird dies, you should not feel personally responsible if you have been caring for it. Many baby birds die each year from different causes including respiratory infections, injuries sustained from falling out of trees, and many unknown causes. You should feel that, at least, the baby bird was given a chance to live that it wouldn't have had if it weren't for you.

coastal
area
management
71 capitol avenue hartford conn. 06115

CAM NEWS

Seven Years After Act, Coastal Management Progress Varies

By David Tedone, Public Participation Assistant

Of the thirty states and five territories which were originally included in the Coastal Zone Management Act of 1972, to date twelve states and one territory have federally-approved Coastal Management Programs, according to the federal Office of Coastal Zone Management. These states are Washington, Oregon, California, North Carolina, Maine, Massachusetts, Rhode Island, Michigan, Wisconsin, New Jersey, Maryland, and Hawaii. Puerto Rico is the only territory. Other states and territories expect approval in the near future, except for two states, Virginia and Illinois, which have been dropped from the program for insufficient progress.

Some states have chosen a "networking" approach to establish their coastal management programs; that is, an approach which draws together existing legal authorities in the coastal area. Others have taken the more difficult route of proposing "new" and specific coastal management legislation. A number of states have used both existing and new authorities to establish their programs. One advantage to the "networking" approach, where authorities are sufficient for federal program approval, is that the arduous and time-consuming process of developing and passing new legislation is avoided. However, many states do not have sufficient existing authorities, and new legislation is specifically needed. States that have combined both methods have made use of existing authorities while drafting new legislation to "fill in the gaps."

The North Atlantic Region, which includes Connecticut, in general has had good success in developing specific management plans and in meeting federal requirements. According to the Office of Coastal Zone Management:

> Maine had its coastal management program approved by the federal agency on September 29, 1978. The state has received $1,485,036 from the federal government to fund its coastal work, and a large portion of that grant has been used to fund local projects supporting the enforcement of state laws and coastal policies -- including urban waterfront design, fisheries and shellfish management, and local ordinances to carry out land and water use laws.
>
> New Hampshire unfortunately suffered a major set-back when its 1979 legislation was defeated recently in the House. The action was ironic because strong comprehensive legislation had been passed in the 1978 session, only to be vetoed by the governor. On the basis of their planning and program development, preliminary federal approval had been granted, with final approval pending the passage of coastal legislation. With the defeat of this year's bill, the future of New Hampshire's coastal management program is uncertain.
>
> Massachusetts had its program approved on May 12, 1978, and the state has received $1,435,000 from the federal government. Massachusetts has promulgated new regulations which bring its program together covering wetlands, ocean sanctuaries, waterways, energy facilities, water quality certificates, scenic rivers, and federal consistency. In addition, funds have been used to stimulate local waterfront development projects, to simplify permit procedures, and to increase permit staffs. Up to one-third of the federal funds received by the state have been made available to local governments to implement program policies.
>
> Rhode Island obtained federal approval on April 16, 1978, and has received federal grants amounting to $1,000,000. The Rhode Island coastal management program is a combined-agency effort, administered by the Office of the Governor in conjunction with the Resource Management Council, the Department of Environmental Management, the Statewide Planning Program, and the University of Rhode Island -- Coastal Resources Center. To date federal funds have been used to establish legal "rights-of-way" to the water and to increase permit staffs and enforcement personnel.

Connecticut has been developing its program and coastal legislation over the past four years. The fate of the legislation will be determined by the 1979 General Assembly, with federal approval anticipated in 1980. The easier "networking" approach was determined not to be appropriate for Connecticut.

New York has submitted to the Office of Coastal Zone Management a "draft" management plan in anticipation of preliminary federal approval. Legislation, covering urban waterfront redevelopment, coastal erosion hazards, and coastal management, is pending before the state's General Assembly. The New York program has been faced with a particularly complicated task because of the size and wide variation of coastlines in the state (Long Island Sound, Long Island Atlantic coast, and Lake Ontario). New York expects to submit its final plan to the federal agency sometime in 1980.

New Jersey obtained federal approval on September 29, 1978, for its program covering the Bay and Ocean shore segments of its coast. These segments comprise 80 percent of New Jersey's coastline. As a result, the program has received $800,000 in federal funds. Management concerns and activities have included assistance to coastal communities, barrier island management, simplification of the coastal permit process, planning for casino development at Atlantic City, and the continuation of a public involvement program. Plans for management of New Jersey's remaining "estuarine" coastline are expected to be submitted to the federal agency in late 1979.

State and territories which have federally-approved programs or which are expected to gain approval in the near future are:

State (or territory)	Actual or Estimated Approval Date	Authorities
Washington	1976	New & existing
Oregon	1977	New & existing
California	1978	New & existing
Wisconsin	1978	Existing
Rhode Island	1978	Existing
Michigan	1978	Existing
North Carolina	1978	Existing
Massachusetts	1978	Existing
Puerto Rico	1978	New
Hawaii	1978	New & existing
Maine	1978	Existing
Maryland	1978	Existing
New Jersey (Bay & Ocean)	1978	Existing
Virgin Islands	1979	New
Alabama	1979	Existing
Delaware	1979	Existing
Guam	1979	--
Louisiana	1979	New
Alaska	1979	New & existing
South Carolina	1979	New & existing
CONNECTICUT	1980	New & existing
Florida	1980	Existing
New Hampshire	1980	New
Georgia	1980	Existing
Mississippi	1980	Existing
Ohio	1980	Existing
New Jersey (Estuarine)	1980	Existing
Northern Marianas	1980	--
American Samoa	1980	--
New York	1980	New & existing
Pennsylvania	1980	Existing

CEQ Directorship

The Connecticut Council on Environmental Quality invites applications for the position of Executive Director. For further information, contact the CEQ office. Resumes will be accepted until June 13. Send to Donald Mackie, CEQ Chairman, Rm. 141, State Office Bldg., Hartford.

Mary Ann Dickinson, Executive Director of the Council, has resigned effective June 1, 1979. Dickinson served as director of the CEQ since March 1978.

Trailside Botanizing

by G. Winston Carter

This beautiful, fragrant Azalea with its sticky reddish hairs on the flower tube is quite similar to the Pink Azalea, or Pinxter Flower (Rhododendron nudiflorum). The blossoms are white, although on rare occasions they are pink-striped to reddish, and appear after the leaves. The upper side of the leaves are glossy, and the buds are usually quite hairy. All of these characteristics help to distinguish this species from the Pink Azalea.

This species grows in greatest abundance in swamps, especially near the coast. It is a medium size to tall shrub, sometimes reaching a height of seventeen feet. The white clusters of flowers usually blossom from June to July, but sometimes as late as September. The structure of the blossom is quite interesting: the flower is fine-lobed with a flower tube which is much longer than the lobes. It usually has fine, long, curved, protruding stamens and one pistil, which also protrudes.

Rhododendron is the Greek word for "rose tree" and refers to the color effect of the masses of flowers which, in many members of this genus, are very colorful. The species name for this flower, viscosum, refers to the stickiness or viscosity of the buds and flower tube.

Swamp Azalea

Rhododendron viscosum

Pam Carter

The Swamp Azalea is but one of the inhabitants that make up the rich and varied life of a swamp. Swamps, or inland wetlands, are valuable not only for the natural beauty of their vegetation but also for their sponge-like ability to hold back and prevent excessive water runoff. Yet too frequently swamps are considered as obstacles that stand in the way of progress, places that should be drained and developed rather than left as interesting habitats that should be protected and preserved.

DEPcitizens' bulletin

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